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manufacturing. It goes without saying that in so small a compass these subjects can not be treated in detail. The book aims to answer the question as to what determinations are usually made in the examination of technical materials. To the average student it would be of little value, owing to the briefness of its descriptions, but the chemist of some training will find it excellent in pointing the way to the proper procedures in technical analysis. CHARLES WILLIAM FOULK.

A Handbook of the Trees of California. By ALICE EASTWOOD, Curator of the Department of Botany, California Academy of Sciences. San Francisco. 1905. (Occasional Papers of the California Academy of Sciences, IX.) Pp. 80. Plates 52.

This is a popular manual of the native trees of California. The author's style is simple and clear. There is no waste of words and the descriptions of the species are in plain English, omitting as far as possible the use of latinized words so highly favored by some systematists. An interesting and most useful departure is the introduction of two artificial keys, one based upon leaf forms, the other on fruit forms. However, the prime excellence of the work depends upon the illustrations. Some of the illustrations are from the drawings of Dr. A. Kellogg, one of the founders of the California Academy of Sciences. The half-tone work is excellent. The trees of Washington and Oregon are included, as it was found that there were only a few not represented in California.

The trees of California are world-known and botanists everywhere will welcome this work. ALBERT SCHNEIDER.

SOCIETIES AND ACADEMIES.

THE BIOLOGICAL SOCIETY OF WASHINGTON.

THE 406th regular meeting of the Biological Society was held in the Assembly Hall of the Cosmos Club, November 25, 1905, with President Knowlton in the chair and 69 persons present.

The first paper of the evening was by Dr. L. O. Howard, presenting 'More Notes on the Yellow Fever Mosquito.' He said that the

next morning after presenting the former communication on the same subject before the society, he left Washington for New Orleans and Texas. At that time (October 28) the Texas quarantine against New Orleans had not been relieved, so that he was obliged to go to Texas first by way of St. Louis. He returned to New Orleans from Texas on November 6 and spent some days in the city studying the conditions that prevailed at that time and talking with the men who had charge of the victorious fight against the yellow fever, then just concluded. He gave a number of observations made by Doctor White, Doctor Richardson, Doctor Blue and other surgeons in the Public Health and Marine-Hospital Service who had been stationed in New Orleans during the summer, relative to the out-of-the-way breeding places in which the yellow fever mosquito had been found, and spoke especially of the new culicide discovered during the summer and which seems to be especially effective against mosquitoes, without having the deleterious properties of sulphur dioxide. Lantern slides were exhibited showing New Orleans breeding places, methods of fumigating houses, and the general characteristics of the portions of the city in which the epidemic had been severest. He also showed a few slides illustrating sanitary conditions at Panama.

In discussion of this paper, Dr. C. W. Stiles said that it is most interesting that our knowledge of the disease includes the facts of its transmission, but of its cause. The disease is handled by methods of prevention. The period of infection necessary to inoculation is known. The female mosquito must transmit the disease to man. In comparison, the best known ticks transmit disease to their progeny, then through them to the human patient. A recent German paper makes the assertion that malaria is transmissible to the offspring of the mosquito. A Paris paper makes the same statement of *Stegomyia*. This is doubted in this country. There are numerous men working on the identity of the yellow fever parasite. Many known Arthropoda are necessary for the transmission of certain diseases. Cholera may be transmitted by flies.

Malaria must be carried by mosquitoes. The Crustacea which carry disease are parasitic. It looks as if an animal parasite were necessary for the transmission of yellow fever. The course of the disease in man is rapid. In the mosquito it is slow. Rapid reproduction is characteristic of a non-sexual method; slow reproduction of a sexual method. It is probable that there is an alternation of generations in the mosquito and man. Characteristic Protozoa which carry disease may be Rhizopoda, Flagellata or Sporozoa. It is probable that the yellow fever parasite belongs to one of these classes.

The second paper was a report of 'The New York Meeting of the American Ornithologists' Union,' by Dr. T. S. Palmer. This meeting has been reported in full elsewhere.

The third paper was by Mr. W. W. Cooke, on 'Discontinuous Breeding Ranges of Birds.' The speaker showed many lantern slides illustrating the facts of summer range, winter range, breeding range, and how in some cases these coincide, in others these overlap, and in still others these are quite separate seasonally, and again even geographically, sometimes by distances almost hemispherical.

E. L. MORRIS,
Recording Secretary.

THE TORREY BOTANICAL CLUB.

The club met at the New York Botanical Garden, October 25, 1905, with Professor Underwood in the chair and eighteen persons present.

The announced program consisted of 'Further remarks on the vegetation of the Bahamas,' by Drs. N. L. Britton and C. E. Millspaugh.

Dr. Millspaugh in opening the discussion remarked that the flora of the Bahamas is so locally distributed that all the islands must be visited before a complete enumeration can be attempted, and that a thorough exploration of the archipelago at an early date is very desirable. He then reviewed the history of the exploration of the Bahamas, mentioning the work of Brace, Britton, Catesby, Coker, Cooper, Eggers, Hitchcock, Howe, Madiana,

Millspaugh, Nash, Mrs. Northrop and Swainson (?); and summarizing the work done upon each island.

It is pretty certain that the islands have all been submerged at a very recent geological period, so that the question as to whether they were ever previously connected with the mainland has no significance for the present plant population. The flora seems to have more in common with Cuba and Hayti than with any other region.

Dr. Britton then described some of the noteworthy features of the flora, exhibiting specimens of several of the recently discovered endemic species, and of the palms.

Dr. Howe discussed some of the marine algæ of the Bahamas, remarking upon the apparently very local distribution of some of the species. He exhibited specimens of a new *Halimeda*, and of a new genus, *Cladocephalus*, soon to be described by him in the *Bulletin*.

Dr. Barnhart remarked that he had recently found some evidence about one Swainson, who is supposed to have collected plants in the Bahamas between 1830 and 1842. Some doubts had been expressed as to whether this could have been William Swainson, the zoologist, who is not known to have been in that part of the world at the time indicated, but the evidence goes to show that the specimens in question had been collected for Swainson by some unknown correspondent, and by him communicated to the herbarium at Kew, where they are now found.

Dr. MacDougal exhibited a mounted series of leaves of two hybrid oaks, *Quercus Rudkini* Britton (supposed to be a hybrid between *Q. marylandica* and *Q. Phellos*), the original specimens of which were recently found to be still growing near Cliffwood, N. J.; and *Q. heterophylla* Bartr. (supposed to be a hybrid between *Q. Phellos* and *Q. rubra*) from Staten Island. The specimens exhibited showed an interesting range of variation, and acorns of both hybrids have been planted, so that they can be studied hereafter in the light of recent theories of evolution.

ROLAND M. HARPER,
Secretary pro tem.

THE CALIFORNIA BRANCH OF THE AMERICAN
FOLK-LORE SOCIETY.

THE fourth meeting of the California Branch of the American Folk-Lore Society was held in Room 22, South Hall, University of California, Berkeley, Tuesday, November 14, 1905, at 8 P.M. Mr. Charles Keeler presided.

The minutes of the last meeting were read and approved. The following persons approved by the council were elected to membership in the society, the secretary being instructed to cast the vote of the society for them: Mr. R. F. Herrick, Mrs. S. C. Bigelow, San Francisco; Mrs. Zelia Nuttall, Mexico; and Mr. and Mrs. Oscar Maurer, Berkeley.

The president spoke briefly on the aims of the society, reviewed its history, and announced coming meetings.

Professor John Fryer then delivered a lecture, illustrated with specially prepared lantern slides, on 'Fox Myths in Chinese Folk-Lore.' Professor Fryer briefly discussed Chinese folk-lore in general, its hold on the mind of the people, the important place occupied by superstitions regarding the fox, and recounted a number of interesting and suggestive fox tales.

Two hundred persons attended the meeting.

THE fifth meeting of the California Branch of the American Folk-Lore Society was held in the Unitarian Church, Berkeley, Thursday, December 7, 1905, at 8 P.M. Professor John Fryer presided.

The minutes of the last meeting were read and approved.

The following persons approved by the council were elected to membership in the society, the secretary being instructed to cast the vote of the society for them: Mrs. M. S. Biven, Oakland, Miss G. E. Barnard, Oakland.

Professor Wm. F. Bade delivered a lecture on 'Hebrew Folk-Lore,' based primarily on folk-lore elements in the Book of Genesis.

At the conclusion of the lecture a vote of thanks was tendered Professor Bade, as also the trustees of the Unitarian Church.

One hundred and fifty persons attended the meeting.

A. L. KROEBER,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE SOILS FOR APPLES.

IN connection with the instructive article of H. J. Wilder on soils suitable for the production of apples (SCIENCE, December 1), I call attention to one point which is only casually mentioned by him.

I think that in general we may draw very useful conclusions as to the primary needs of culture plants from the habitats of their wild congeners or progenitors. In the case of the apple, we have the wild 'crab apple as a precedent; and any one who has paid attention to such matters will remember the groves of fragrant crab apples on the black prairies of the middle west and southwest, where they sometimes form the almost exclusive tree growth, though varied occasionally with clumps of the large-fruited red-haw (*C. coccinea*) and a honey locust here and there. The soils of these prairies are all distinctly and sometimes strongly calcareous; and where the latter is the case we usually find the highest color both of blossoms and of fruit of the crab, and also the most abundant crop. The tree at times invades adjacent hills, and here we may see, by way of contrast, pale flowers and fruit, on long branches with a sparse crop.

The wild apple is distinctly a calciphile plant, frequenting the heaviest as well as light sandy soils, provided sufficient lime carbonate be present. The latter condition rarely exists in the humid region in very sandy soils, because from these the lime is quickly leached into the subsoil or subdrainage whenever they are cultivated. Hence naturally the failure of apple orchards to maintain themselves on sandy soils for any length of time, as indicated by Wilder. For it is *a priori* reasonable to suppose that the cultivated apple, while *tolerating* soils poor in lime, will also prefer the calcareous soils on which its ancestors flourished, sometimes to the exclusion of all other tree growth.

The fact that a reasonably calcareous soil is one of the prime conditions for profitable apple culture will, I think, be found abundantly verified in the apple-producing districts of the United States. But it must be understood distinctly that the current definition of